International commitment, post-entry growth and survival of international new ventures

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Abstract

This paper makes several contributions to the emerging literature on the post-entry behavior of international new ventures. Based on an extensive longitudinal data set, we investigate the dynamics of commitment, growth and survival of different types of newly internationalizing Belgian firms. Global start-ups have the highest initial and rapidly rising export commitment per market and are also more likely to continue exporting over time than geographically focused start-ups, and traditional staged exporters. However, global start-ups also display the highest failure rate. This high failure rate appears to result primarily from the 'liability of newness' and less from the added complexity associated with rapid and wide scope internationalization.

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1. Introduction

Following Oviatt and McDougall's seminal contribution in 1994, international business and entrepreneurship scholars have produced a vast body of research on international new ventures (INVs). This strong and growing interest has been reflected in reviews of the broad spectrum of academic research on INVs by Rialp et al. (2005) and international entrepreneurship (IE) by Keupp and Gassmann (2009) and Jones et al. (2011). The literature produced in various countries and contexts focuses mainly on subject matter such as the conceptualization of INVs (e.g. Oviatt and Mc Dougall, 1994; Knight and Cavusgil, 1996; Madsen and Servais, 1997) and the factors influencing their inception and development (e.g. Weerawardena, et al., 2006). However, the literature on the growth and performance of INVs is less developed as a recent study by Prashantham and Young (2011) has highlighted. Although INVs play an increasingly important role in today's economy (Shrader et al., 2000; Zahra, 2005), few studies have tracked their evolution over time (Zahra, 2005; Jones et al., 2011). As a result, the impact of early internationalization on the performance, growth and survival of INVs is not well understood (Zahra and George, 2002), and the possible long-term benefits for the firm are unclear (Zahra, 2005; Sapienza et al., 2006).

The purpose of this paper is to contribute to the emerging literature on the growth and post-entry performance of INVs by adding a strategic perspective to the entrepreneurship and learning perspectives and by showing its relevance in relation to the development of INVs. We also contrast the internationalization paths of INVs with other, more traditional patterns, and do so by applying a strategic perspective to foreign market entry that follows Kalish et al.'s (1995) discussion of product diffusion

strategy. Thus, we focus on the timing and geographical scope of internationalization and not on the characteristics of these firms or the drivers of internationalization. Our paper makes several contributions to the literature, based on a unique and extensive data set of Belgian small and medium-sized enterprises (SMEs). First, we investigate the initial commitment of INVs and other types of newly internationalizing SME in foreign markets. Second, accounting for initial commitment and correcting for possible selection bias, we analyze differences in post-entry growth in foreign markets. Third, by analyzing which firms withdraw from and which remain active in international markets, we examine the continued commitment to exporting of the different types of newly internationalizing SME. Fourth, we analyze the failure rate of INVs and other newly internationalizing SMEs in comparison to domestic new ventures. Finally, by applying a strategic lens to our analysis, we offer a more complete understanding of post-entry internationalization paths, complementing other perspectives that focus on (e.g.) learning.

These contributions directly address some important gaps in the international entrepreneurship literature. Although several researchers (e.g. Jones and Coviello, 2005; Wright et al., 2007) suggest that the complexity of internationalization calls for a longitudinal research design, the evolutionary patterns of INVs are not well understood (Zettinig and Benson-Rea, 2008) and studies on INV survival are rare (Jones et al., 2011). Similar points are raised regarding the lack of longitudinal investigations (Coviello and Jones, 2004; Zahra, 2005), and our study is one effort to address these concerns. Second, Zahra and George (2002) call for more representative samples in IE research. In studying the population of SMEs in Belgium across a broad range of industries, this paper also goes beyond the 'judgment and purposive sampling' that characterizes most IE research (Coviello and Jones, 2004). This allows us to investigate the internationalization of firms in industries with different degrees of exposure to global competitive pressure (Chetty and Campbell-Hunt, 2003).

2. Alternative development paths of newly internationalizing firms

Traditional models of firm internationalization emphasize a gradual process of learning and increasing commitment to international markets, first entering psychically close markets (Johanson and Vahlne, 1977; Eriksson et al., 1997). The traditional approach has been challenged by models of INVs that, from the outset, establish footholds in many foreign markets not only because of the wide scope of the relevant markets in which they need to compete but also because of the need to develop and leverage critical resources. The fast process of internationalization among young firms led to the introduction of several new concepts such as 'born global', 'global start-up' and 'international entrepreneurs' to describe the various types of INV (see e.g. Oviatt and McDougall, 1994, 1995; Madsen and Servais, 1997; Knight et al., 2004).

A common feature of INVs is that these young companies internationalize via entrepreneurial action rather than through a gradual build up and deployment of resources abroad (McNaughton, 2003; Knight et al., 2004). Risk-taking and innovation are key ingredients in this behavior, mediated by the characteristics, experience and networks of the entrepreneur (Madsen and Servais 1997; Coviello, 2006; Mathews and Zander, 2007; Zhou, et al., 2007; Cavusgil and Knight, 2009). INVs often operate in knowledge-intensive or high-technology environments, characterized by high research and development costs combined with short product life cycles (Bell, 1995; Boter and Holmquist, 1996; Bell et al., 2003). In addition, limited local demand in small or emerging countries can push firms to explore opportunities abroad and lead to fast internationalization (Bell et al., 2003; Fan and Phan, 2007; Lopez et al., 2009). With the spread of supply chains across countries, an increasing number of firms need to connect to these chains at an early stage and follow their lead customers. In sum, the forces driving the globalization of industries coupled with the perceptions and capabilities of entrepreneurs in a global context are prime factors determining the speed and success of their international involvement. The knowledge base of the firm and the shape and scope of the international networks in which the firm is

involved are strong moderators of this process (Coviello and Jones, 2004; Oviatt and McDougall, 2005; Johanson and Vahlne, 2009, De Clercq et al., 2012; Fernhaber and Li, 2012).

Beyond the above, the specific role played by industry conditions in the creation of INVs has received increasing attention (Fernhaber et al., 2007). An interesting theoretical model is one proposed by Kalish et al. (1995) in the context of introducing a new product to the market. Combining dynamic product diffusion models with game theoretic competitive interactions over time, they a) investigate the optimal timing and scope (number of countries) for introducing a new product in a set of foreign countries, and b) identify alternative profit-maximizing strategies. Depending on the industry environment in domestic and foreign countries (e.g. demand, growth, number of competitors) and the cost of entering foreign markets, Kalish et al. (1995) showed that firms will either choose rapid expansion using a so-called sprinkler strategy, targeting multiple countries simultaneously over a short time span, or opt for a waterfall strategy where firms slowly expand, cascading gradually from one country to the next over time.

Using a sprinkler strategy, firms can maximize revenues and exploit economies of scale in R&D and manufacturing. Moreover, a sprinkler strategy may pre-empt competitive moves in some countries, thus maximizing sales. Entering markets ahead of competitors may result in substantial first-mover advantages, as established by Mascarenhas (1997). In contrast, a waterfall strategy allows firms to benefit from lead effects and spillovers from earlier country entries, and limit investment in manufacturing, inventory, advertising, distribution and human resources. If the firm is unsuccessful, it can refrain from investing in other countries. When success materializes, income from the first market can be used to invest in a subsequent market. Consequently, a waterfall strategy can lower the pressure on cash flow. Choosing between a sprinkler and a waterfall strategy has been linked to a strong trade-off between revenue maximization and risk minimization (Stremersch and Tellis, 2004).

Following from the above, we frame our study on the work of Kalish et al. (1995), and view the formation of INVs as the outcome of the strategic choice that firms make concerning their international expansion path. That is to say, we take a strategic perspective implying that firms face different competitive environments for their market offerings, forcing them to make clear choices about the timing and scope of their international operations (Hashai, 2011). Firms can opt for internationalization early or late in their life cycle, using a sprinkler or waterfall strategy to spread their activities across borders. We adapt Oviatt and McDougall's (1994) classification of INVs, focusing on geographical scope (see also Madsen et al., 2006; Kuivalainen et al., 2007) and add a timing dimension. This allows us not only to look at different forms of INV but also to make a comparison with firms starting to export after being long established in the domestic market.

More specifically, we distinguish between and compare: 1) global start-ups; 2) geographically-focused start-ups; and 3) traditional exporters. The global start-up is an INV exporting on a global scale (Oviatt and McDougall, 1994). Using the logic of Kalish et al. (1995), the wide scope and rapid internationalization of a global start-up suggests a sprinkler type of strategy. These firms are similar to 'born globals' as defined in some other studies (Rennie, 1993; Knight, 1996; Aspelund and Moen, 2005; Madsen et al., 2006). The geographically-focused start-up is an INV exporting to a smaller set of countries, all within the same region (here, the EU). They are similar to 'early internationals' (Aspelund and Moen, 2005), 'born internationals' (Kuivalainen et al., 2007) or 'born regionals' (Lopez et al., 2009). Importantly, however, while also stimulated to expand into foreign countries from the start, their rather narrow scope resembles more a waterfall type of strategy than a pure sprinkler strategy. Finally, the traditional exporter is the late exporter as discussed by Madsen et al. (2006). This type of firm starts exporting to one country – or to a small set – and does so only after having established itself in the

domestic market. Such a gradual expansion pattern is similar to that of a waterfall strategy and accords with a firm using a 'staged' international expansion process (Johanson and Vahlne, 1977).

3. International commitment, growth and survival: Hypotheses

A combination of the strategic perspective (coupled with arguments from entrepreneurship) and the learning perspective allows us to formulate different testable hypotheses concerning post-entry development. The hypotheses focus on differences in commitment, post-entry growth and survival among the different types of firm, classified according to the timing and scope of their first international sales.

A firm's initial commitment to international markets, as reflected in the scale of sales in the first year after entering new foreign markets, is likely to vary, depending on its market entry strategy; a strategy that will be guided by industry conditions. For example, short product cycles, competitive and fast-growing markets, and large markets are conditions that favor the adoption of a sprinkler strategy over a waterfall strategy (Kalish et al., 1995; Bell et al., 2003). The essence of a sprinkler strategy is to make a credible foreign market commitment in order to rapidly gain market position and discourage other entrants. Since INVs, and particularly global start-ups, often emerge in technology and knowledge-intensive industries (Bell, 1995; Knight and Cavusgil, 1996) characterized by dynamic and global competition, a greater initial commitment to foreign markets can be expected. Interestingly, many of these firms tend to operate in niche markets, where firms often enjoy first-mover advantages but also need to defend their position vis-à-vis other specialized global competitors (Fontes and Coombs, 1997; Bell et al., 2003; Zucchella et al., 2007). Hashai (2011) underlines the importance of the initial commitment in terms of geographical scope and finds that INVs, particularly those we refer to as global start-ups, tend to stick to a chosen expansion path in building up this commitment. A geographically-focused start-up also considers from the outset the international market as the relevant market for its

products and where the actual competition takes place (Aspelund and Moen, 2005). However, the smaller scope of countries to which the geographically-focused start-up exports fits logically into a waterfall strategy. The waterfall strategy is motivated by the avoidance of entry costs and aims to maximize the benefits from lead effects and spillovers from one market to another. Firms using waterfall strategies make smaller initial commitments to international markets and increase commitment as spillover effects materialize over time. From a strategic perspective, most of these firms tend to operate in markets where international competition is less strong (Fernhaber et al., 2007), and waterfall strategies occur as the most obvious option (Kalish et al., 1995). The waterfall pattern also fits traditional exporters. Different from geographically-focused start-ups, however, this type of firm does not consider the international market its relevant market from the outset. The behavioral pattern typical for such firms is rather reactive (Bell et al., 2003) and characterized by very cautious experiential learning (Leonidou and Katsikeas, 1996). The initial commitment of traditional exporters to foreign markets can therefore be expected to be very small and is likely to increase only if knowledge accumulates, and if the spillovers that emerge stimulate to expand their markets, in line with a staged development process (Johanson and Vahlne, 1977). The arguments above lead us to the following hypothesis linking the type of firm to the commitment made in penetrating a new foreign market:

Hypothesis 1: Global start-ups will have the strongest initial commitment to foreign markets, followed by geographically-focused start-ups. Late internationalizing traditional exporters will have the smallest commitment.

The way INVs grow in international markets has received increasing attention in the IE literature. Firms starting to internationalize early show superior growth rates in international markets (Autio et al., 2000). Autio et al. (2000) related this to the concept of 'learning advantages of newness' derived from the knowledge-based and learning foundations of the resource-based view of the firm (Barney and Zajac,

1994). According to this view, older firms tend to be locked into routines originally developed for the domestic market. This lock-in prevents them from learning and developing new competencies to successfully grow in diverse international markets. In contrast, young firms can more flexibly adjust to new market environments, with positive attitudes about foreign markets providing scope for additional growth opportunities beyond the domestic market (Brush, 1992; Bell et al., 2003). Different from traditional exporters, rapid internationalization by INVs (global start-ups and geographically-focused start-ups) triggers a process of accelerated learning and adaptation (Barkema and Vermeulen, 1998; Lu and Beamish, 2001). As found by Zhou et al. (2010), INVs actively invest in upgrading capabilities and use external and internal networks to learn and improve efficiency in operating across countries, with knowledge contributing to rapid growth (Zahra et al., 2000; Sapienza et al., 2006; Prashantham and Young, 2011). Among INVs, global start-ups operating from the beginning in a wide set of countries are radically exposed to diverse technological, cultural and business environments (Hitt et al., 1997). This international diversity enhances technological learning and sales growth (Zahra et al., 2000) and may also account for the finding that global start-ups tend to use more active learning strategies, including experimenting, tolerating failure and solving problems as they arise (Chetty and Campbell-Hunt, 2003). From a strategic point of view, a sprinkler strategy most logically associated with a global start-up aims to rapidly gain a strong market position and competitive advantage in foreign markets (Kalish et al., 1995; Stremersch and Tellis, 2004). This should result in a persistently strong growth rate in foreign sales. In contrast, the waterfall strategy, which seeks to benefit from spillover effects from sequentially entering foreign markets, will show a growth in sales over time, if the market spillover effects materialize. Hence, from the strategic perspective as well, we expect global start-ups to show higher export growth rates than geographically-focused start-ups and, *a fortiori*, traditional exporters. Typically for this last group of firms, sales growth in foreign markets has been associated with cautious experiential learning and a gradually increasing commitment over time (Johanson and Vahlne, 2009). Thus, for newly internationalizing firms, we argue:

Hypothesis 2: Global start-ups will have the fastest growth in total export sales, followed by geographically-focused start-ups. Traditional exporters will have the slowest export sales growth.

Following the logic of trial and error, a reversal of the decision to internationalize will occur if opportunities in foreign markets do not materialize as expected (Bonaccorsi, 1992). However, a sprinkler strategy based on a strong initial commitment to foreign markets should preclude easy exit. An easy exit would undermine the credibility of a strategy seeking to discourage other firms from entering the market (see e.g. Ghemawat and Del Sol, 1998). As most global start-ups operate in high-technology and globalized industries, the relevant market in which they have to compete (i.e. where the competitive interaction among firms is high) typically comprises several countries and, hence, requires a commitment to continue exporting to these markets (Bell et al., 2003; Fan and Phan, 2007; Onkelinx and Sleuwaegen, 2011). Rapid and extensive geographical expansion not only increases commitment to international operations but also requires well-considered proactive planning (Bell et al., 2003; Kuivalainen et al., 2007). The probability of complete withdrawal from international markets declines as the overall commitment to foreign operations increases (Benito, 1997). This view is supported by Pauwels et al. (2009) who find that internationalization intensity is positively associated with the propensity to continue internationalization. A risk-minimizing waterfall strategy will only show a gradually rising commitment over time. To minimize risk, the initial commitment will also typically be limited, making foreign market exit less costly (Welch and Wiedersheim-Paul, 1980). Such strategies are typical for traditional industries characterized by distinct national markets (Bell et al., 2003; Stremersch and Tellis, 2004). Associating waterfall strategies with geographically-focused start-ups and traditional exporters, we expect these types of firm to more easily reverse their exporting decision. However, given the strategic orientation of geographically-focused start-ups toward international markets from the outset and the more pro-active learning observed in early internationalizing firms, we

expect fewer withdrawals from export markets than for traditional exporters. The cautious reactive behavior and experiential learning observed in traditional exporters that only start to export after being well established in the domestic market makes withdrawal more likely (Kuivalainen et al., 2007). Thus, among the newly internationalizing firms:

Hypothesis 3: Global start-ups will show the highest probability of continuing to export over time, followed by geographically-focused start-ups. Traditional exporters will show the lowest probability.

Finally, the stronger commitment to international markets does not eliminate the risk of failure to survive. On the contrary, the decision to start exporting to many different foreign markets on a significant scale puts pressure on available resources and may substantially increase costs and risk of failure in the short run (Sapienza et al., 2006). However, there is also substantial evidence that, prior to expanding abroad, firms self-select and only the most efficient ones will internationalize, reducing excess risk (Bernard and Jensen, 1999). Some authors also find that learning by exporting gives rise to substantial productivity gains, increasing the chances of firm survival over a longer period (e.g. De Loecker, 2007).

Early internationalization may be expected to create extra risk. This applies to geographically-focused start-ups and global start-ups. For the latter group of young firms entering multiple countries concurrently, the increased commitment and complexity of co-ordination across many countries may increase the risk of failure (Shrader et al., 2000). The choice between a sprinkler and a waterfall strategy therefore implies a trade-off between revenue maximization and risk minimization (Stremersch and Tellis, 2004). Apart from the chosen strategy, the two forms of INV typically face three types of liability (Zahra, 2005) which increase the risk of failure. Such firms are often small and have limited slack resources to overcome the challenges of internationalization (Bell, 1997). In addition to the liability

of smallness, these firms are faced with the liability of newness (Stinchcombe, 1965; Brüderl and Schüssler, 1990) and the liability of foreignness in markets institutionally different from the home country (Zaheer and Mosakowski, 1997). As a result, some researchers (Eriksson et al., 1997; Sapienza et al., 2006) posit that INVs are characterized by high failure rates in the early years of their existence, with the failure risk higher for global start-ups than for geographically-focused start-ups. Although there are also learning advantages of newness and associated flexibility generated over time (Autio et al., 2000) which may enable INVs to benefit from knowledge gained in international markets and thus reduce the risk of failure, our expectation is that the traditional exporters will have the least risk of failure. Traditional exporters are established firms, not new to the industry, and typically engage in cautious foreign expansion at a later stage in their life cycle. Thus, we posit that, for newly internationalizing SMEs:

Hypothesis 4: Global start-ups will show the highest failure rate, followed by geographically-focused start-ups. Traditional exporters will have the lowest failure rate.

4. Data and Methodology

In collaboration with the National Bank of Belgium, we constructed a comprehensive data set linking firm-level trade data to annual accounts data. Foreign trade data are based on customs data for extra-EU trade and the Intrastat inquiry for intra-EU trade. These data contain the value of exported and imported goods broken down by country of destination or origin and by type of good. Hence, the database contains data on the value of each product type that a firm exported to every export destination. Data were available for 1998-2005, with additional control variables available for 1993-1997. In addition to detailed information on the export sales of all firms, the data set contains information on foreign direct investment. Only 1.6 percent of firms in our sample had one or more foreign subsidiaries. Although our analysis is focused on export transactions and the growth of these

transactions over time, we control for the presence of subsidiaries located abroad and verify if they complement or substitute exports.

All firms in our sample are small and medium-sized enterprises (SME) following the employment criterion of the Eurostat definition: firms with fewer than 250 full-time equivalent (FTE) employees (European Commission, 2009), excluding financial firms and micro-enterprises with less than 10 FTE employees. Belgium provides an interesting setting to examine small firm internationalization with SMEs accounting for 70 percent of GDP and 45 percent of total exports in Belgium. Nevertheless, despite the limited domestic market, many SMEs in Belgium do not export (Onkelinx and Sleuwaegen, 2010). The final data set contains 35,184 SMEs, including 14,080 established exporters (exporting before 1998), 15,227 domestic (i.e. non-exporting) firms and 5,800 firms that started exporting between 1998 and 2005. This approach generates results that cover all industries and differs in this respect from earlier studies that are often based on a limited sample of firms or specific industry cases (Coviello and Jones, 2004; Keupp and Gassman, 2009). To clearly distinguish the strategic choices these firms make in their internationalization processes, we focus on newly internationalizing firms, i.e. those firms that start exporting in the period covered in the data set. The sample includes recently established firms (i.e. the two types of INV) that started to export within five years of inception, and older firms (established before 1993) that reported their first export activity between 1998 and 2005. Focusing on timing and scope, we can distinguish between firms that start exporting early or late, using a narrow or a global scope and distinguish between the relevant types of firm. Among the early internationalizing firms, INVs with a global scope are 'global start-ups' and those with a narrow scope are 'geographically-focused start-ups'. Late exporters with a narrow scope are traditional exporters[1]. Descriptive statistics and correlations are presented in Table 1.

[1] The sample also includes a very small group of firms that are older than five years and started to export with a global scope in the observation window. In the literature, such firms have been identified as born-again globals (Bell et al. 2001).

Insert Table 1 about here

To distinguish traditional exporters from INVs (i.e. global and geographically-focused start-ups), the time required for an INV to report its first international activities ranges from immediately after inception to eight years in the literature (Gabrielsson and Kirpalani, 2012). Lacking critical arguments, Gabrielsson et al. (2008) argue in favor of flexibility over the time period. From the extant literature, the available data, and taking the idiosyncrasies of the Belgian context into account, we adopt a pragmatic approach and define early internationalization as exporting within five years of inception, and define global scope as exporting to at least five countries in at least two geographical regions (i.e. at least one outside the EU). We follow Gabrielsson et al. (2008) and Lopez et al. (2009) who argue that, to be considered 'global', a firm must reach beyond its immediate geographical region. Johanson and Vahlne (2009) state that most born globals (i.e. global start-ups) are in fact born regionals (i.e. geographically-focused start-ups). This view is supported by Knight et al. (2004) who found that born globals in Europe are less global than comparable US firms, often confining their reach to other EU countries. The thresholds of five years and five countries may appear somewhat arbitrary, as are those used by other authors. However, checking for robustness, we did not find that the results were especially sensitive to the chosen thresholds.

The degree of internationalization is often measured in terms of export scale and/or scope. Export scale is measured as a percentage of foreign sales to total sales, often using 25 percent as a cut-off to identify born globals (Knight and Cavusgil, 1996; Madsen et al., 2000; Moen, 2002). However, as noted by Gabrielsson and Kirpalani (2012), the export ratio depends on the size of the domestic market and neighboring countries. As suggested by Kuivalainen et al. (2007), using criteria for US firms (i.e. the 25

However, these firms are small in number (n=77) and unevenly distributed or absent in many industries. The small and unequal sub-sample has forced us to exclude born-again globals from the empirical tests.

percent exports to sales ratio used in Knight and Cavusgil, 1996) is not appropriate in a European context or to small countries in general. A firm could very well qualify as a global start-up even if its export sales derived from a single neighboring country. Consistent with Oviatt and McDougall (1994), we focus on export scope, defined in terms of number of countries, rather than scale. Scope is also more appropriate in assessing the trade-offs between the high risk and the complexity of a sprinkler strategy (entering multiple countries simultaneously) and a more cautious, slow growth waterfall strategy (sequential market entry).

4.1 Initial commitment to foreign markets

The firm's total export commitment, measured as exports relative to the total sales of the firm, can be expressed as follows:

$$X/S = (\bar{X}/S) * N_p * N_c$$

and decomposed in logarithmic terms (ln) :

$$\ln\_(X/S) = \ln\_(\bar{X}/S) + \ln\_N_p + \ln\_N_c$$

Where X = total exports, S = total sales of the firm, $\bar{X}$ = average exports per product and per country, N_p = number of export products, N_c = number of export countries.

Following the logic of this decomposition, we ran a regression analysis for the typical firm with the firm's logarithm of exports to sales (ln_export/sales) as dependent variable and the logarithms of the number of products (ln_#products) and the number of countries (ln_# countries) of the exporting firm in the initial export year 1998 as explanatory variables. By including industry dummies[2], we were able to estimate the initial commitment as the industry specific (logarithm of) average sales per exported

[2] 58 industries using Nacebel 2 digit industry codes.

product and country as a percentage of total sales in 1998. The commitment corresponds to the estimated coefficients of the industry dummies. To distinguish differences in commitment among newly internationalizing firms in 1998, we added specific dummies for each type of newly exporting firm (global start-up, geographically-focused start-up and traditional exporter). The coefficient of the dummy measures the extent to which the initial commitment (exports per product and per country in 1998) of the different types of newly internationalizing firm differs from the commitment of established exporters in the same year, which are taken as the reference group (dummy excluded). Using a logarithmic specification, the new exporters' dummy coefficients can be roughly interpreted as the approximate percentage differences from the average commitment per product and per country of the established exporter[3]. This provides a test of Hypothesis 1.

We also included additional controls for firms sourcing from abroad or with subsidiaries abroad. As many firms source from abroad and minimally process and/or resell those products to foreign markets, we controlled for extra export sales that are transiting and do not involve a real commitment. Consequently, we added the logarithm of imports to sales (ln_import/sales) as an extra covariate in the regression, allowing for the possible substitution of own production by imported goods. Similarly, we controlled for possible substitution of exports by sales through foreign affiliates. We included a dummy, equal to one for Belgian firms that are foreign controlled as the result of inward Foreign Direct Investment (Inward FDI) and a dummy, equal to one for Belgian firms with investments abroad (Outward FDI).

4.2 Export growth

To test differences in post-entry export growth among types of newly exporting firm (Hypothesis 2), we related the logarithm of the firm's annual export growth (value of exports) over the period 1998-2005

[3] The coefficient corresponds to the logarithm of the factor to be multiplied with the commitment of established exporters (exporting SMEs that were not new exporters in the observation period).

(ln_export growth) to the logarithmic value of exports at the starting year 1998 (ln_export). Since we want to ensure that export growth is driven by the firm's own productive export performance (the latent variable) rather than by imported performance, we added the logarithm of intensity of the firm's imports per FTE employee in 1998 (ln_import/FTE) as an explanatory variable in the growth regression (Coucke and Sleuwaegen, 2008). We again included a dummy variable for each type of firm to distinguish growth effects by type of newly exporting firm. The reference firm (dummy excluded) is the established exporting firm (SME already exporting before 1998). We first ran an OLS regression followed by a Heckman two-stage estimation to account for possible selection bias from excluding firms that stopped exporting.

4.3 Probability of continuing to export

The probability of continuing to export (Hypothesis 3) was estimated following the Heckman selection model, i.e. the probit model of continued export over the observation window. The technological performance of the firm, measured as the logarithm of the total factor productivity[4] (ln_TFP) of the firm in 1998 was added as an extra regressor, assuming that technologically advanced firms will show a stronger commitment to foreign markets (Bell et al., 2003).

4.4 Failure to survive

The failure rate of newly internationalizing firms (Hypothesis 4) was measured by the exit rate per industry, i.e. the number of firms exiting from the industry during the observation window as a percentage of the number of firms in the initial year 1998. Exit was defined as a firm that had ceased to exist and no longer reported employment in 2005. Only cessation of activities was considered as failure, excluding mergers and take-overs. We calculated failure rates per type of new exporter. To better identify risks coming from the liability of newness and from the complexity of entering new foreign

[4] Total Factor Productivity (year=1998), calculated following the method described in Aw et al (2003). Cost shares of inputs, are derived from the National Bank of Belgium's Central Balance Sheet Office.

markets, including the cost of overcoming the liability of foreignness, we added the failure rates of two additional control groups: established exporters and domestic new ventures. Established exporters are SMEs that have been exporting prior to 1998 and still export in our observation window. Domestic new ventures are young firms (established in 1998 or later) that did not export between 1998 and 2005. We then calculated failure rates per industry (58 industries) and performed a paired t-test for differences in failure rate among the various types of firm within the industry.

5. Empirical results

As stated before, to test the different hypotheses specified in Section 3, we compared the different types of newly exporting firm to a group of established exporters. These firms are older SMEs that had embarked on export activities prior to 1998. The analysis concentrates on firms that started to export in 1998, the first year of our observation window. Among the 5,800 newly internationalizing firms in our data set, 1,226 (21%) are global start-ups, 1,775 (31%) are geographically-focused start-ups and 2,799 (48%) are traditional exporters. Our data are primarily related to international trade activities. We do not have detailed data on the coordination of other value-chain activities across countries as used in the conceptualization of INVs by Oviatt and McDougall (1994). However, from the trade data, we find foreign sourcing to be particularly important for global start-ups, 89 percent of which are importing goods from other countries. The figure drops to 54 percent for geographically-focused start-ups. In contrast, only 30 percent of traditional exporters also import goods from other countries.

5.1 Initial commitment to foreign markets

In the previous section, we hypothesized that both types of INV, global start-ups and geographically-focused start-ups, show a stronger initial commitment to the export markets than traditional exporters, with the strongest initial commitment from global start-ups. Below, we test this hypothesis for SMEs starting to export in 1998. The initial commitment is estimated as the average scale of foreign (export)

sales per individual country and per product realized in the first year of exporting. The results in Table 2 (first column) show a commitment for global start-ups that is about 24 percent higher (β = .209) than the established exporter, supporting Hypothesis 1. This is consistent with the revenue-maximizing sprinkler strategy, which can be logically associated with global start-ups. Geographically-focused start-ups also have a higher initial commitment (β = .164), although not significantly different statistically from the control group of established exporters. Traditional exporters show a minor commitment, about 37 percent lower than the established exporter, when they start exporting, as suggested by the large negative coefficient (β = -.455). The coefficient for the number of products is significantly below one, suggesting an unequal distribution of sales for the different products. Controls for inward and outward FDI are negatively associated with the exports to sales ratio, suggesting that firms based in Belgium and without FDI use the country more intensively as an export platform.

Insert Table 2 about here

Interestingly, when the same analysis is carried out at the end of the observation period for those firms that still exported in 2005, the difference in commitment between global start-ups and traditional exporters has narrowed, but remains significant (Table 2, second column). Traditional exporters are no longer different from long-established exporters (the reference group). This evidence suggests a gradually rising commitment process for traditional exporters (Johanson and Vahlne, 1977), in contrast to the strong initial and persistently rising international commitment of global start-ups (Bell et al., 2003). The difference in export intensity between geographically-focused start-ups and traditional exporters is also no longer significant in 2005. This suggests that traditional exporters over time intensified their commitment in each of the countries they penetrated, resulting in convergence with the average export commitment of long-established exporters, the control group in the regression.

5.2 Export growth

The OLS regression results presented in Table 3 (first column) show that export growth remains very erratic among all firms, as implied by the large unexplained variation. Interestingly, controlling for the initial export sales and import intensity, the results show a substantially larger growth for newly internationalizing firms. The effect is most marked for global start-ups followed at some distance by geographically focused start-ups. For traditional exporters, the estimated coefficient is not very different from the one estimated for geographically focused start-ups, but the standard error is large, such that the t-test fails to reach an acceptable confidence level. The coefficient of the dummy for Inward FDI is also not significantly different from zero. Outward FDI, on the other hand, is positively associated with export growth, suggesting that a substantial part of this higher export growth for firms with foreign affiliates consists of growing intra-firm trade over time.

While these results provide evidence to support Hypothesis 2, in testing the model, we need to be concerned with possible selection bias by including only continuing exporters in our sample. To deal with this selection bias, we performed a Heckman two-stage estimation of the model. In the first stage, the selection equation, we ran a probit model to establish the probability that firms will continue to export until 2005. Using this information in the second stage of the model, we estimated the firms' export growth conditional on being a continuing exporter. The results of the Heckman estimation are presented in Table 3.

Insert Table 3 about here

From the outcome equation, the 2nd stage estimation in Table 3, we calculated marginal effects on export growth, shown in Table 4. Reassuringly, comparing column 3 with column 4 of Table 4, we observe little difference between the conditional marginal effects of the Heckman estimation and the marginal effects of the OLS estimation of the model, discussed earlier. As expected, the unconditional marginal effects (column 3) for continuing and non-continuing exporters together are smaller and, for

traditional exporters, close to zero (0.007).The last result suggest a strong impact of non-continuing exporters on (average) growth for the whole group of traditional exporters, including continuing and non-continuing exporters.

Insert Table 4 about here

5.3 Probability of continuing to export

According to the marginal effects calculated from the selection equation (Table 3) and presented in the first column of Table 4, the probability of continuing to export over the whole period drops by 21.5 percent for traditional exporters and by 13.3 percent for geographically-focused start-ups. This is consistent with the waterfall strategy, focusing on risk minimization rather than revenue maximization The low probability of continued export by traditional exporters suggests the least committed strategic orientation towards internationalization and a very cautious reactive behavior (see also Bell et al., 2003). For global start-ups, the extra drop-out effect is small, only 4.1 percent, which supports their strong commitment to global markets. This evidence is consistent with the sprinkler strategy and strongly supports Hypothesis 3.

5.4 Failure to survive

The foregoing results demonstrated important differences among newly internationalizing firms in withdrawing from export markets. In 29 percent of the cases, this withdrawal accompanied a complete exit of the firm from the industry, i.e. the failure to survive. The failure rates are presented in Table 5. The systematic comparison, including a paired t-test for differences in failure rate between the various types of firm supports Hypothesis 4, but it also highlights some unexpected results. Among the newly exporting firms, global start-ups have the highest failure rate and traditional exporters the lowest. The failure rate of traditional exporters is significantly lower than that of global start-ups and geographically-focused start-ups. Besides the timing of the first export, the major difference between the two types of

INV and traditional exporters is the age of the firm. The impact of firm age on survival chances has been well documented in the literature (e.g. Bernard and Jensen, 2007). Geographically-focused start-ups, as well as global start-ups, are young firms (less than five years old), while traditional exporters are older established firms in the industry. In support of the age effect, we find a similar significant difference in failure rate between domestic new ventures and traditional exporters. Similarly, the difference in failure rate of global and geographically-focused start-ups versus domestic new ventures is also not statistically significant (95 percent confidence level).

Insert Table 5 about here

Comparing the failure rates of global start-ups with those of geographically-focused start-ups; we observe a difference of about 3 percentage points lower for geographically-focused start-ups. However, this difference in failure rate fails to reach statistical significance at a 95 percent confidence level. This result suggests that the complexity arising from entering diverse countries simultaneously, including the difficulties of overcoming the liability of foreignness in these countries, does not generate a significant extra failure risk. However, we need to emphasize that this risk is measured for countries to which firms have chosen to export. Many countries will be avoided if the liability of foreignness and associated risk are too high. The failure rate of newly exporting older firms – i.e. traditional exporters – is at approximately the same level as observed for established exporters. This again suggests that starting to export, including the difficulties of overcoming barriers in the foreign market, does not substantially add to the risk of failure.

6. Discussion and conclusions

Responding to the need to fill the gap in the literature to improve our understanding of the post-entry behavior of INVs, we have tracked the evolution of newly internationalizing firms over time, with a focus on export growth, commitment and survival of INVs. To this end, we have used a unique and large

longitudinal micro data set covering Belgian firms' export operations across all industries over the period 1998-2005. The firms analyzed are all small and medium-sized enterprises. In this paper, we take a strategic perspective to help better understand why newly internationalizing firms show different development paths. This is important because, despite the considerable research attention paid to accelerated internationalization, the paths of INVs after their initial entry into international markets remain unclear. In combination with two other theoretical perspectives, entrepreneurial decision making and learning, the strategy perspective offers an improved understanding of the development path (commitment, growth and survival) of newly internationalizing firms. Adding the strategic perspective not only helps us to better understand the development process of INVs versus traditional exporters that only start to internationalize at a later stage in their life cycle, but it also helps us to understand why INVs are not all the same and why they show differences in their development paths. We make four original contributions to the international entrepreneurship literature, enriching our understanding of the underlying development process in newly internationalizing firms.

First, different from earlier work that overlooked the strategic link between scope and scale of entry, our evidence shows that global start-ups not only export to more markets but also have the highest initial export per market entered and continue to increase their commitment over time. The wide scope of countries entered in their early life and the strongest commitment found for global start-ups is typical of a sprinkler strategy, an offensive strategy to rapidly build up a strong competitive position in foreign markets. In contrast, geographically-focused start-ups and, very markedly, traditional exporters are less committed at the outset, in line with a waterfall strategy and a more cautious market penetration approach. The higher initial commitment of geographically-focused start-ups versus traditional exporters accords with the first group of firms' strategic orientation toward, and preparation for, foreign markets, which are, from the outset, considered the relevant markets in which to operate (Bell et al., 2003; Aspelund and Moen, 2005; Kuivalainen et al., 2007). This is less the case for traditional exporters

whose small initial but gradually rising commitment is also strongly consistent with a cautious experiential learning approach – an approach that is central to the stage models of internationalization (Johanson and Vahlne, 1977). In contrast, active learning and networking across countries are more typical and have been more often found in cases that describe the rapid development of INVs (Coviello, 2006; Prashantham and Dhanaraj, 2010).

Second, the rich longitudinal data set enabled us to reveal the dynamics that follow entry into international markets. We find that early internationalization is typically associated with faster overall export growth of the firm. Again, global start-ups exhibit higher growth rates than geographically-focused start-ups. While rapid internationalization and international diversity may induce active learning and enhance a firm's capabilities to grow (Zahra et al., 2000; Lu and Beamish, 2006; Zahra and Hayton, 2008; Carr et al., 2010), the strategic perspective offers a strong complementary rationale for the observed differences. This strong growth of global start-ups is consistent with a sprinkler strategy and a focus on sales maximization to rapidly gain a strong market position (Kalish et al., 1995; Stremersch and Tellis, 2004). Limiting the scope of countries (with its consequent slower export growth) accords with a waterfall strategy and the post-entry dynamics of geographically-focused start-ups. The waterfall strategy seeks to benefit from lead and spillover effects across markets. The growth in exports sales reflects this process with exports rising more gradually over time when market spillover effects materialize. This last approach also accords with traditional exporters. Earlier work on this group of firms primarily emphasized the cautious experiential learning process in relation to the growth of sales in foreign markets. Highlighting the different growth outcomes in relation to the chosen market penetration strategy adds a new insight and complements earlier work on the strategic orientation of INVs – in particular global start-ups –, and the global character of their competitive strategy (Jantunen et al., 2008; Kuivalainen et al., 2008, Tuppura et al., 2008).

Third, on the basis of the data available, we could equally well analyze differences between types of firm in their persistence in continuing to export to foreign markets, a topic largely ignored in previous literature. We find that, among the newly internationalizing firms, the higher initial commitment of global start-ups is associated with the highest likelihood of continuing to export, only followed at a distance by geographically-focused start-ups. Again, this finding is consistent with sprinkler strategies pertaining to global start-ups. With a sprinkler strategy, the firm will typically make large credible commitments in foreign markets to discourage competitors and rapidly gain a strong market position. As commitment to foreign operations increases, firms are less likely to withdraw from international markets (Benito, 1997; Kuivalainen et al., 2012). Smaller commitments can easily be reversed if spillover effects tend to be small or feedback from the foreign market proves to be unfavorable. An easier withdrawal accords with a waterfall strategy and the desire to minimize risk (Stremersch and Tellis, 2004). Compared to a sprinkler strategy, the firm employing a waterfall strategy grows more slowly in foreign markets. The slower growth makes it more vulnerable to competitive attacks in foreign markets. The lower commitment and slower growth of geographically-focused start-ups and traditional exporters accords with the higher probability of withdrawing from exporting observed in the two types of firm. Traditional exporters show the lowest probability of continued export. Different from geographically-focused start-ups, traditional exporters do not integrate foreign countries into their relevant markets from the outset, suggesting a weaker strategic orientation toward international markets and a more reactive cautious approach (Jones, 2001; Bell et al., 2003).

Fourth, by examining the failure rate of different types of INV in comparison with several reference groups of firms, we find that the failure rate of both global and geographically-focused start-ups is not significantly different from that observed for domestic new ventures. This is surprising, as we expected the risk and liabilities associated with early and global expansion to substantially increase an INV's risk of failure (Zahra, 2005; Sapienza et al., 2006). This unexpected result can, however, be reconciled with

McDougall and Oviatt (1996) who found that INVs do not suffer performance penalties when compared with domestic new ventures. The high failure rate of all types of new venture, (global start-ups, geographically-focused start-ups and domestic new ventures alike) in comparison with traditional exporters is consistent with a strong 'liability of newness' effect. The latter effect increases the failure rate of all new ventures, irrespective of their geographical scope. Traditional exporters are older ventures that have at least survived a period of six years before starting to export, which, for the majority of companies, is regarded as a crucial period in which survival is determined (U.S. Small Business Administration, 1992). Another unexpected finding is that entering a larger set of countries over a short timespan, characteristic of global start-ups and a sprinkler strategy, goes together with a failure rate for global start-ups that is not significantly higher than that observed for geographically-focused start-ups. This suggests that the complexity of entering multiple markets at the same time, including the difficulties in overcoming the liability of foreignness in a wide range of, often very diverse, countries does not create a substantial and systematically higher (observed) extra risk for global start-ups. From a strategy point of view, the insignificant difference in failure rate between global and geographically-focused start-ups fails to provide indirect support to the claim that managers primarily choose a waterfall strategy instead of a sprinkler strategy to minimize risk (Stremersch and Tellis, 2004). Strategic considerations related to the market environment appear to be more important in the choice. However, it should be mentioned that we have analyzed the medium-long term implications for survival and therefore cannot rule out a higher failure risk in the very early internationalization period. We measured the failure rate over a longer period of eight years after the firms' first international sales. Over this longer period active learning, networking and diversification across countries may have helped to reduce the risk of failure (Hitt et al., 1994; Shrader et al., 2000). We also cannot control for the possible self-selection of better-prepared and fast-learning flexible firms in early and wide scope internationalization (Shrader et al., 2000; Tuppura et al., 2008; Autio et al., 2011; Prashantham and Floyd, 2012; Efrat and Shoham, 2012).

6.1 Managerial implications

Our study shows that, despite the liabilities they face, young small and medium-sized firms with limited resources can successfully enter and compete in international markets. Differences in their post-entry development suggest the use of differentiated strategies, most notably the use of a sprinkler versus a waterfall strategy. In choosing between a sprinkler and a waterfall strategy, managers should seek to maximize consistency with the firm's overall competitive strategy, which, in turn, should be consistent with the industry environment of the different foreign countries that the firm has chosen to penetrate. A waterfall strategy allows firms to sequentially enter foreign markets and benefit from spillovers from one market to the next. In slowly growing industries, and industries where competition is not strong, a waterfall strategy allows firms to capitalize on spillover benefits and, at the same time, minimize risk while expanding abroad. In highly competitive industries, characterized by short product life cycles and rapidly growing markets, a sprinkler strategy is more appropriate. A sprinkler strategy can maximize revenues for small firms operating in a global niche market, without necessarily adding excessive risk. Being well prepared and making a commitment of time, people and resources to exporting reduces the short-term risk of failure, while continued international commitment can enhance survival in the long run. Related literature (e.g. Prashantham and Dhanaraj, 2010) has shown that sharing knowledge in local and global networks and drawing on the experiences of successful – but also of failed INVs – can help to better control and manage the overall risk of starting up an INV and sustaining its growth. The ability to explore and apply new knowledge is crucial for INVs' survival (Zettinig and Benson-Rea, 2008).

Our results clearly indicate that early internationalization and operating in multiple markets offer additional growth opportunities. In this context, it is important to mention that global start-ups are not a marginal phenomenon. They accounted for approximately 21 percent of all firms that started exporting

from Belgium between 1998 and 2005 and created 27 percent of all export growth over that period. Geographically-focused start-ups accounted for 31 percent of newly internationalizing firms but only accounted for 3 percent of all export growth between 1998 and 2005. Diversity in terms of markets is an asset, and managers should actively exploit the learning advantages from operating in differentiated markets. One of the mechanisms behind this successful growth in multiple countries is the 'learning advantage of newness' and the flexible adaptation of the business model to foreign market conditions (Autio et al., 2000).

Our findings also have important implications for traditional exporters, i.e. firms that start to export very cautiously and with little commitment, and that only do so after being firmly established in the domestic market. This behavior results in a lower commitment to continue exporting. Previous studies have shown that firms that continue to export over a longer time are more likely to survive than their domestic counterparts (Bernard and Jensen, 2007). Hence, while starting to export does not harm young firms' survival chances, continuing to export actually helps to enhance long-term survival. International competition incentivizes firms to actively learn and improve performance. This should stimulate managers to see exporting as an important instrument for learning and continuous growth. It should, therefore, receive due attention at an early stage in the design and implementation of long-term competitive strategies.

6.2 Limitations and future research

Finally, it is important to mention some limitations in our research. First, the study focused on quantitative measurements and ignored the qualitative dimensions related to the management and organization of internationalizing firms. As a result, we were unable to observe whether firms actually implemented a waterfall or a sprinkler strategy. We could only observe consistency in the international development of firms with predictions derived from the discrete strategic approaches employed. Further

qualitative research analyzing cases relating to the different types of firm should shed additional light on the post-entry development process in relation to the implementation of sprinkler versus waterfall strategies. Second, the export data used in our study cover only export of goods. Given the increasing importance of services in international trade (U.S. Department of Commerce, 2005), a follow-up study on services, would provide an interesting complement to our work. Third, as is the case for any single country study, our findings may not apply in other contexts. Even using a large longitudinal data set covering all industries, it is hard to generalize our results, especially taking Belgium's particular context into account. Belgium, together with Singapore and Ireland, is one of the most open economies in the world. Its central location in an integrated European market, combined with a multilingual workforce, reduces the barriers to internationalization. We recommend an extension of our analysis to other countries to provide further validation and generalization of the results.

TABLES AND FIGURES

Table 1: Descriptive statistics and correlations

		mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	inward FDI 1998	0.03	0.16	1																
2	inward FDI 2005	0.04	0.19	0.55*	1															
3	outward FDI 1998	0.01	0.11	0.28*	0.23*	1														
4	outward FDI 2005	0.02	0.12	0.19*	0.48*	0.30*	1													
5	Global Start-up	0.03	0.18	0.02*	0.01	0.07*	0.03*	1												
6	Geographically Focused Start-up	0.05	0.22	-0.01*	-0.02*	0.01*	0.00	-0.04*	1											
7	Traditional Exporter	0.08	0.27	-0.02*	-0.02*	-0.01*	-0.01	-0.05*	-0.07*	1										
8	Ln Imports / sales 1998	-2.10	2.12	0.03*	-0.01	0.00	-0.01	0.05*	-0.02	-0.20*	1									
9	Ln Imports / sales 2005	-2.19	2.21	0.01	-0.01	-0.02	-0.02	0.07*	-0.07*	-0.16*	0.69*	1								
10	Ln exports 1998	12.88	2.89	0.20*	0.14*	0.18*	0.14*	0.11*	-0.19*	-0.29*	0.28*	0.18*	1							
11	Ln exports 2005	13.13	2.93	0.14*	0.13*	0.18*	0.16*	0.17*	-0.15*	-0.30*	0.23*	0.32*	0.67*	1						
12	Ln Average export growth 1998-2005	0.05	0.29	-0.08*	-0.03	-0.03*	0.01	0.05*	0.08*	0.06*	-0.04*	0.12*	-0.41*	0.40*	1					
13	Ln Number of export products 1998	1.41	1.18	0.19*	0.15*	0.17*	0.13*	0.09*	-0.14*	-0.20*	0.29*	0.25*	0.59*	0.37*	-0.20*	1				
14	Ln Number of export products 2005	1.49	1.23	0.13*	0.13*	0.16*	0.15*	0.10*	-0.13*	-0.22*	0.24*	0.27*	0.34*	0.58*	-0.20*	0.70*	1			
15	Ln Number of export countries 1998	1.48	1.12	0.18*	0.17*	0.17*	0.16*	0.16*	-0.23*	-0.28*	0.22*	0.17*	0.75*	0.50*	-0.26*	0.61*	0.38*	1		
16	Ln Number of export countries 2005	1.59	1.17	0.12*	0.14*	0.16*	0.18*	0.23*	-0.21*	-0.30*	0.18*	0.23*	0.47*	0.75*	0.28*	0.37*	0.60*	0.70*	1	
17	Ln Total Factor productivity 1998	9.07	0.59	0.14*	0.08*	0.16*	0.08*	0.04*	0.02*	-0.01	-0.05*	-0.05*	0.10*	0.086*	-0.01	0.05*	0.05*	0.06*	0.07*	1

*Pairwise correlations, *p<.05*

Table 2: Regression exports to sales ratio

	ln_export/sales 1998 b/se		ln_export/sales 2005 b/se
ln_import/sales 1998	0.222***	ln_import/sales 2005	0.276***
	(0.013)		(0.014)
ln_# products 1998	0.256***	ln_# products 2005	0.242***
	(0.023)		(0.023)
ln_# countries 1998	1.054***	ln_# countries 2005	1.064***
	(0.026)		(0.026)
Inward FDI	-0.457***	Inward FDI	-0.508***
	(0.071)		(0.067)
Outward FDI	-0.356***	Outward FDI	-0.197***
	(0.097)		(0.096)
Global Start-up	0.209***	Global Start-up	0.255***
	(0.079)		(0.070)
Geo. focused Start-up	0.164	Geo. focused Start-up	0.105
	(0.115)		(0.094)
Traditional Exporter	-0.455***	Traditional Exporter	-0.047
	(0.152)		(0.290)
industry dummies included	yes	industry dummies included	yes

* p<0.10, ** p<0.05, *** p<0.01

Number of obs.	= 5,537
F(9, 5475)	= 460.98
Prob > F	= 0.0000
R-squared	= 0.5520
Adj R-squared	= 0.5470
Root MSE	= 1.5608

Number of obs.	= 5,006
F(9, 4947)	= 469.86
Prob > F	= 0.0000
R-squared	= 0.5666
Adj R-squared	= 0.5615
Root MSE	= 1.5915

Table 3: Export growth: OLS and Heckman estimation

	OLS	Heckman 2nd stage	Heckman 1st stage
	ln_export growth	ln_export growth	select
	b/se	b/se	probit export
ln_export 1998	-0.0562***	-0.0457***	0.0884***
	(0.002)	(0.005)	(0.007)
ln_import/FTE 1998	0.0161***	0.0187***	0.0301***
	(0.002)	(0.003)	(0.009)
Inward FDI	0.000	-0.0058	-0.0864
	(0.013)	(0.015)	(0.063)
Outward FDI	0.0587***	0.0623***	0.073
	(0.017)	(0.019)	(0.088)
Global Start-up	0.0740***	0.0563***	-0.1149***
	(0.013)	(0.015)	(0.060)
Geo. Focused Start-up	0.0459**	0.0022	-0.3607***
	(0.021)	(0.030)	(0.075)
Traditional Exporter	0.0414	-0.0292	-0.5672***
	(0.034)	(0.050)	(0.108)
ln_TFP 1998			0.1525***
			(0.031)
industry dummies included	yes	yes	yes
Inverse Mills ratio		0.2018**	
		(0.101)	

* p<0.1, ** p<0.05, *** p<0.01

Number of obs.	= 4,986
F(5, 4928)	= 159.33
Prob. > F	= 0.0000
R-squared	= 0.1935
Root MSE	= 0.2533

Number of obs.	= 7,118
Censored obs.	= 2,166
Uncensored obs.	= 4,952
Wald chi2(55)	= 533.28
Prob > chi2	= 0.0000

Table 4: Marginal effects – probability of continuing to export and export growth

variable	Marginal effect probability of continuing to export (1)	Heckman unconditional marginal effect (2)	Heckman conditional marginal effect (3)	OLS Marginal effect (4)
ln_export1998	0.030	-0.036	-0.054	-0.055
ln_M98/FTE	0.010	0.012	0.016	0.016
Global Start-up	-0.041	0.043	0.069	0.072
Geographically-Focused Start-up	-0.133	0.017	0.041	0.044
Traditional Exporter	-0.215	0.007	0.036	0.042

Industry dummies included

Table 5: Differences in failure rates for different types of exporters and domestic new ventures[5]

	Average industry failure rate†	Δ Established exporter	Δ Traditional exporter	Δ Global start-up	Δ Geo. focused start-up
Established exporter	10.0%				
(SE)					
t					
Traditional exporter	8.6%	-0.01882			
(SE)		0.019			
t		-0.966			
Global start-up	19.8%	0.09120	0.10660		
(SE)		0.046	0.041		
t		1.9819*	2.5688**		
Geo. focused start-up	16.0%	0.06535	0.06109	-0.03265	
(SE)		0.028	0.025	0.058	
t		2.3020**	2.3971**	-0.5676	
Domestic new venture	20.9%	0.07649	0.11746	0.02690	0.03018
(SE)		0.023	0.034	0.052	0.036
t		3.3794***	3.4920***	0.5128	0.8268

Paired t test of average industry failure rates of different types of SME.

† Average (arithmetic mean) of failure rates at nacebel 2 digit industry level (58 industries)

****p<.01; **p<.05*

[5] When interpreting the data presented in Table 4, one should consider the following definitions:

- 'Established exporter' refers to SMEs exporting prior to and in the period observed (1998-2005) (i.e. the reference group in the regressions).
- 'Domestic new venture' refers to all SMEs, established in 1998 or later, that neither imported nor exported in this period.
- 'Global start-up, Geographically focused start-up and Traditional exporter' follow the definition given in Section 4.

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